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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/609,374	07/01/2003	Mirosław Z. Bober	1906-0117P	1201
2292 7590 05/30/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER TUCKER, WESLEY J	
			ART UNIT 2624	PAPER NUMBER
			NOTIFICATION DATE 05/30/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

## Office Action Summary

Application No.

10/609,374

Applicant(s)

BOBER ET AL.

Examiner

Wes Tucker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 17-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date \_\_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's amendment filed March 26<sup>th</sup> 2007 has been entered and made of record.
2. Applicant has cancelled all previously presented claims 1-16 and added new claims 17-36. New claims 17-36 are pending.
3. Applicant's remarks in view of the newly presented amendments are not found to be persuasive for at least the following reasons:

Applicant argues that the reference to Osada does not disclose the claimed feature of "projecting and accumulating the selected points onto the axis or axes for  $m$  of the  $n$  variables, corresponding to the  $n$ -dimensions of the Hough Space." Examiner submits that this is exactly what Osada does. This feature of projecting and accumulating the selected points onto the axis of the variable defined in Hough space is interpreted as a histogram in Hough space because that is how it is defined in applicant's specification (page 5, lines 10-15 and Fig. 8). Osada performs the exact same operation (Fig. 4 and column 3, lines 25-45). Osada accumulates a histogram from the points in the Hough space rendering peaks of the histogram to be used in determining further image information.

Applicant discusses at length the differences in the accumulated peaks in both Osada and the present invention and how they are used. Let it be clear that none of these subtleties appear in the language of the independent claims. Osada's Hough

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space histogram is interpreted as being equivalent to the histogram claimed by applicant formed from "projecting and accumulating variables on an axis in Hough space.

The rejection in view of Osada is therefore maintained and accordingly made FINAL.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 17-24 and 28-36 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,629,989 to Osada.

With regard to claim 17, Osada discloses a method of analyzing an image comprising performing a Hough transform on points in an image space to an n-dimensional Hough space (Fig. 1, element 3),

selecting points in the Hough space representing features in the image space (column 3, lines 25-45),

characterized by projecting and accumulating the selected points onto the axis or axes from  $m$  of the  $n$  variables, corresponding to the  $n$ -dimensions of the Hough space, where  $m$  is less than  $n$  (column 3, lines 25-45, see Histogram in Hough space), and analyzing  $m$  of the  $n$  variables for the selected points, where  $m$  is less than  $n$ , to derive information about the features in the image space (column 3, lines 38-46).

Osada discloses a Hough transform processing method that uses information gathered from the Hough transform to determine significant edges. Osada discloses determining peaks from the histogram and thresholding the peaks in order to analyze less than all of the selected points. This is interpreted to read on analyzing  $m$  of the  $n$  selected point where  $m$  is less than  $n$ . The projection and accumulation of values is interpreted simply as the histogram taught by Osada.

With regard to claim 18, Osada discloses the method of claim 17 comprising detecting points for the Hough transform using feature detecting means comprising any of edge or corner detecting means or colour feature detecting means (Fig. 1, element 2).

With regard to claim 19, Osada discloses the method of claim 17 comprising identifying peaks in the accumulated values, and using the corresponding values for the  $n$  variables (column 3, line 35-45). Osada identifies peaks and the peaks are determined by the accumulation of the variables.

With regard to claim 20, Osada discloses the method of claim 19 comprising analyzing the relationships between the values from the  $m$  variables corresponding to the peaks in the accumulated values (column 3, lines 35-45). The relationships between the values are interpreted as frequency distributions found in the histogram.

With regard to claim 21, Osada discloses that  $n=2$  and  $m=1$  (column 3, lines 35-45). The histogram measures one of the two dimensions.

With regard to claim 22, Osada discloses wherein that the two coordinate systems are  $(x, y)$  and  $(r, \theta)$  (column 4, lines 10-50).

With regard to claim 23, Osada discloses the method of claim 22, wherein the analysis involves analyzing the values of  $\theta$  (column 5, lines 45-52).

With regard to claim 24, Osada discloses the method of claim 17, wherein the step of selecting points in the Hough space involves identifying local peaks and comparing the local peaks with a threshold (column 4, lines 25-37 and column 7, lines 5-15). Each peak is itself compared to the other peaks which serve as thresholds. Each peak is examined in order of magnitude. This is interpreted as being compared with a threshold.

With regard to claims 28 and 29, the discussion of claim 17 applies. Osada discloses both an apparatus and a computer readable medium (column 3, lines 20-35).

5. Claims 30-36 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,638,465 to Sano et al.

With regard to claim 30, Sano discloses a method for generating a threshold for identifying features in a subject image using the Hough transform,

the method comprising generating a plurality of reference images (column 15, lines 54-64),

for each reference image performing a Hough transform and deriving a histogram of accumulated values in Hough space (column 17, lines 30-50),

combining the histograms for the reference images (column 17, lines 54-67), and using the combined histograms to derive a threshold (column 18, lines 31-42).

Sano discloses using training images to create multiple Hough transform histograms. Those histograms are weighted and summed to create a combined histogram. The measures gathered from the weighted image are used to set a threshold for determining important features.

With regard to claim 31, Sano discloses wherein the reference images have similar statistical properties to the subject image (column 15, lines 54-67).

With regard to claim 32, Sano discloses wherein the reference images are randomly generated (column 15, lines 54-67).

With regard to claim 33, Sano discloses wherein said combining histograms comprises averaging (column 17, lines 40-45).

With regard to claim 34, Sano discloses wherein said threshold is for identifying peaks in a histogram from a Hough transform of an image (column 18, lines 1-40). The threshold disclosed by Sano characterizes the accumulated histogram in identifying which features are distinct which is related to the peaks of the histogram.

With regard to claims 35 and 36 the discussion of claim 30 applies. Sano discloses both an apparatus and a computer readable medium for perform the method discussed (column 6, lines 31-45).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



6. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patents 5,629,989 to Osada and 5,638,465 to Sano et al.

With regard to claim 25, Osada discloses the method of claim 24 but does not explicitly disclose wherein the threshold is derived by generating a plurality of random reference images, for each reference image performing a Hough transform and deriving a histogram of accumulated values in Hough space, combining the histograms for the reference images, and using the combined histograms to derive a threshold.

Sano discloses a method for generating a threshold for identifying features in a subject image using the Hough transform,

the method comprising generating a plurality of reference images (column 15, lines 54-64),

for each reference image performing a Hough transform and deriving a histogram of accumulated values in Hough space (column 17, lines 30-50),

combining the histograms for the reference images (column 17, lines 54-67), and using the combined histograms to derive a threshold (column 18, lines 31-42).

Sano discloses using training images to create multiple Hough transform histograms. Those histograms are weighted and summed to create a combined histogram. The measures gathered from the weighted image are used to set a threshold for determining important features.

Sano's method teaches determining a threshold using multiple images that are used to determine statistical values. It would have been obvious to one of ordinary skill in the art at the time of invention to use the histogram accumulation and threshold determination of Sano in combination with the Hough space histogram manipulation of Osada in order to better represent and determine the statistical values of a cross section of images.

With regard to claim 26, Sano discloses wherein the reference images have similar statistical properties to the subject image (column 15, lines 54-67).

7. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patents 5,629,989 to Osada and 6,363,161 to Laumeyer et al.

With regard to claim 27, Osada discloses a method as claimed in claims 1, 2 and 4, but does not explicitly disclose wherein the analysis of the selected points is for identifying man-made structures and/or for distinguishing between urban/non-urban areas. Laumeyer discloses a Hough transform for enhancing image edge information similar to Osada, wherein the enhanced image edge information is used to identify road signs and the like in an urban driving environment (column 4, lines 45-67). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use

enhanced edge information of Osada to help identify man-made structures such as road signs using a Hough transform as taught by Laumeyer.

### ***FINAL REJECTION***

8. Applicant's amendment necessitated the new grounds of rejection presented in the Office Action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### ***Contact Information***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 571-272-7427. The examiner can normally be reached on 9AM-5PM.

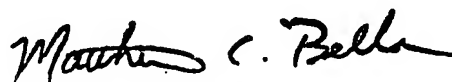
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wes Tucker

5-18-07



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